

REMARKS

In the Office Action dated June 30, 2005, the Examiner rejected independent claim 1 as previously amended and claims 2-10, 12 and 14-15 that depend on it as defining subject matter obvious in view of U.S. Patent No. 4,631,685 to Peter, in view of (the translations of) German Patent No. DE 34 29 776 to Moll and the Picchio Reference (*"Guarltiero Picchio, Novita Nella Saldatura A Ultrasuoni, Interplastics, Technique Nuove, Milan, IT, Bd. 14, No. 4, July 1, 1991 (1991-07-01), pages 84-86"*). The Examiner further rejected claims 11 and 13 as being unpatentable over the '685 patent to Peter, the '776 patent to Moll, and the Picchio reference, and further in view of U.S. Patent No. 5,855,706 to Grewell.

In this Response, Applicant amends claim 1 to incorporate the limitations of claim 11, and cancels claim 11. Applicants cancel and amend the claims solely to expedite prosecution and do not acquiesce to any of the Examiner's rejections. Applicants reserve the option to further prosecute the same or similar claims in the present or a subsequent application.

Applicant respectfully requests that the Examiner reconsider the rejections of claims 2-15, in light of the above amendments and the following remarks.

Amended Claim 1

Without waiving other arguments concerning whether amended claim 1 is taught by the combination of references cited by the Examiner, Applicants discuss one portion of the claim, as amended, which they respectfully submit is not taught by the combination of references.

In amending claim 1 herein, Applicant adds the following limitation of former claim 11 to claim 1:

the at least one welding process parameter to be altered consists of one or more of: an amplitude of the sonotrode, a frequency of the sonotrode, a pressure acting on the parts to be welded, a force acting on the parts to be welded, and an energy input into the parts to be welded.

This limitation refers to the following limitation (the “altering a welding process parameter” limitation) of claim 1:

in the event the actual curve differs from the set curve at a time of comparison, depending on the difference between the set curve and the actual curve, at least one welding process parameter affecting welding is altered to a value chosen based on that existing difference in order that the difference is reduced during welding after the time of comparison and the actual curve converges toward the set curve.

Taken together, these limitations are a fundamental innovation of the application under review, and are not taught in the cited prior art, whether that art is taken alone or in combination. The important feature is that specified welding process parameters (which do not include time) may be altered, in response to an actual curve differing from a set curve. The alteration is in order to cause the difference between the actual and the set curve to be reduced, and the alteration made may depend on the existing difference.

In rejecting claim 1 prior to its current amendment, the Examiner stated in the Final Office Action that “Peter ... does not disclose, depending on the existing difference between the set curve and the actual curve, of at least one welding process parameter affecting welding being altered to a value based on that existing difference such that an equalization of the set curve and the actual curve occurs during further welding.” Office Action, p. 2. Thus, the Examiner did not cite Peter as teaching the “altering a welding process parameter” limitation set forth above.

The Examiner cited DE 34 29 776 to Moll as teaching “comparison of actual welding energy curves with set welding curves.” Office Action, p. 3. However, the Examiner did not cite DE ‘776 as teaching the “altering a welding process parameter” limitation.

With reference to claim 1, the Examiner cited the Picchio Reference as teaching the “altering a welding process parameter” limitation. In particular, the Examiner stated that Picchio taught “in response in the monitoring of the welding parameters (Page 84, 2nd Column, 1st Paragraph ...) that the method of operating the ultrasonic machine can include steps of amending the welding time and energy.” Office Action, p. 3. The Examiner stated

that “[t]his would often result in an equalization of the set to actual curve.” The Examiner further stated that “Picchio further discloses that this operation mode ... would reduce considerably the percentage reject rate by ensuring equalization of the welding energy.” The Examiner then concludes that “it would have been obvious ... to have utilized equalization in order to reduce the percentage reject rate.” Office Action, p. 3.

Applicants respectfully submit that the “altering a welding process parameter” limitation, as limited in amended claim 1 to apply to the enumerated welding process parameters *other than time*, is neither disclosed nor rendered obvious by the Picchio Reference. Referring to the complete translation of the Picchio Reference submitted herewith in the Supplemental Information Disclosure Statement of December 30, 2005, it can be seen that the paragraph immediately following that cited by the Examiner teaches that

It is thus possible to monitor the energy required to obtain an optimum weld....[I]t is possible to identify, *and so remove from the production line*, those workpieces which, because they have not absorbed the same quantity of energy within a predetermined range, should be considered rejects.
(Emphasis added.)

Thus, this portion of the Picchio Reference placed in context *teaches away from* adjusting welding parameters based on a difference between an actual curve and a set curve in order to obtain a satisfactory weld. Rather, it teaches using measurements of energy *in a method of rejecting welds considered defective*.

Nor does the remainder of the Picchio Reference teach this limitation of amended claim 1. Unlike claim 1 in its prior form, amended claim 1 now enumerates the specific welding process parameters which it encompasses, and the enumeration does *not* include welding time. The second portion of the Picchio Reference previously submitted in translation, however, teaches that “[a]nother interesting feature ... is the possibility to amend the welding *time*....” (Page 85, 3rd Column, 1st Line to Page 86, 1st Column, 5th Line) (Emphasis added.) This teaches that the *end point* of the welding process may be changed. It does *not* teach or make obvious in any way that the welding parameters now set forth in amended claim 1 -- amplitude of the sonotrode, frequency of the sonotrode, pressure acting

on the parts to be welded, force acting on the parts to be welded, and energy input into the parts to be welded -- *can be adjusted to new values to be in effect while the weld continues*, based on a difference between an actual and a set curve, to make an actual curve converge toward a set curve.

Thus, in summary, the only reference, Picchio, previously cited by the Examiner as teaching the “altering a welding process parameter” limitation of claim 1 does not teach claim 1 as amended, wherein the welding process parameters that may be altered do not include time. It follows that amended claim 1 should be allowed.

For completeness, we also briefly address the references cited by the Examiner in rejecting original claim 11. As noted above, original claim 11, prior to its current amendment, added the following limitation to original claim 1:

wherein the at least one welding process parameter to be altered includes one or more of: an amplitude of the sonotrode, a frequency of the sonotrode, a pressure acting on the parts to be welded, a force acting on the parts to be welded, and an energy input into the parts to be welded.

In rejecting dependent claim 11, the Examiner stated that “Peter suggests changing the welding displacement.” Office Action, p. 5. (The Examiner does not cite any specific portion of Peter.) However, as discussed above the Examiner has recognized that “Peter ... does not disclose, depending on the existing difference between the set curve and the actual curve, of at least one welding process parameter affecting welding being altered to a value based on that existing difference such that an equalization of the set curve and the actual curve occurs during further welding.” Office Action, p. 2. Thus, the Examiner recognizes that Peter does not teach claim 1, in its prior form or as now amended.

(Moreover, Peter discloses *turning off the energy* based on the value of a specific parameter, displacement. Abstract, lines 6-8; col. 1, lines 34-41; col. 3, lines 55-59. The turn-off occurs when a preset value is reached, *not* when measured actual displacement *deviates* from a desired displacement. In Peter, it is expected that the chosen preset displacement value which triggers the energy turn-off will be reached in the course of every normal weld process. Moreover, when that preset value is reached, the energy supply is *not*

adjusted to a new value depending on the displacement, in an effort to correct for the deviation between an actual and a set curve. It is turned off.)

In rejecting former dependent claim 11, the Examiner further stated that DE 34 29 776 to Moll and the Picchio Reference “utilize the changes resulting from measuring the power to change the energy supplied to the sealing jaws which also relates to the force acting on the parts and the energy input into the parts welded.” Office Action, p. 5. (The Examiner does not provide specific citations to portions of these references.)

Applicant respectfully suggests that DE ‘776 to Moll does not teach the limitations set forth above now at issue in amended claim 1. Moll compares actual to set values to classify welding parts as of poor quality *for sorting purposes*:

If deviations ... occur in the actual value curves, ... an output unit is activated ... so that badly welded parts can be separated. Only welded parts that correspond to the tolerance specifications are further processed. (Moll Translation, p. 15, lines 10-16)

Moll also monitors total energy:

[T]he total energy is added and checked as to compliance within the tolerance range, so that also the control of ... total energy ... for the weld is ensured. (Moll Translation, p. 16, lines 3-6)

But this in no way suggests *altering* one of the welding parameters set forth in amended claim 1 to cause an actual value to converge toward a set value.

With respect to the Picchio Reference, as discussed above it suggests changing the *time* of the weld, which is not a welding parameter to be altered within the scope of amended claim 1. As discussed above, Picchio does not suggest changing any of the enumerated welding parameters in amended claim 1, based on a difference between a set curve and an actual curve to cause those curves to converge.

Finally, the Examiner stated with respect to original claim 11 that “Grewell ‘706 further suggests varying the motional amplitude ... and ... the frequency... [and] suggests that variation of the amplitude and frequency results in a stronger weld.” Office Action, pp. 5-6. But in Grewell adjustments are made to a *predetermined* new value. See, e.g., Figure

6, col. 9, lines 34-36, col. 1, lines 29-31 (“the motional amplitudes and engaging forces of the ultrasonic transducer horn in contact with the workpiece are varied *over particular profiles* during the weld cycle”) (emphasis added), while in claim 1 as amended herein the magnitude of the adjustment may be chosen depending on the magnitude of the divergence between the time-dependent set curve and the actual value, in order that the actual value converges to the set value.

Also, in Grewell the adjustment is *not* for the purpose of making an actual curve conform to a set curve from which it has *diverged*. The adjustment is made *in normal operation* at a certain point in the process. In Grewell, Figure 6 shows the amplitude being reduced to a predetermined lower value, so that melting will be slower; there is no effort being made to match any deviating value to a set curve, and indeed no suggestion that any deviation from any expected value has occurred. In amended claim 1 herein, however, the purpose of the adjustment is to make a *diverging* actual curve converge to a set curve. In amended claim 1, a welding parameter is adjusted *when and if* the actual measured value of a parameter *deviates* from the time-dependent value desired (i.e., from the set value or curve). As noted above, the language of the limitation in amended claim 1 requires that the parameter be altered “in the event the actual curve differs from the set curve at a time of comparison.” The welding parameter according to amended claim 1 is *not* required to be adjusted if the actual curve followed the set curve exactly, without deviating, throughout the weld process. And in claim 1 when an adjustment is made because a deviation has occurred the magnitude of the adjustment may be chosen based upon the magnitude of the deviation in order to cause the deviation to be reduced or eliminated (i.e., to cause the measured value to approach or reach the set value).

In sum, none of the references cited by the Examiner, alone or in combination, teach the alteration of one of the specified welding process parameters set forth in amended claim 1, in response to an actual curve differing from a set curve, and based upon that difference, so that the difference is reduced and the curves converge.

Accordingly, Applicant asks that the Examiner reconsider and allow claim 1, as amended herein.

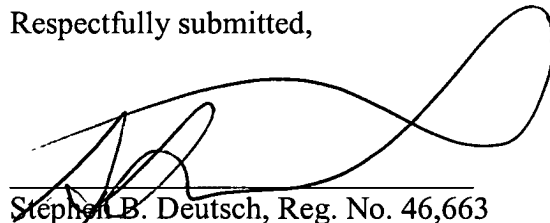
Claims 2-10, 12-15

Claims 2-10, and 12-15 depend directly or (in the case of claim 9) indirectly from amended claim 1. Insofar as claim 1 now is in condition for allowance, therefore, claims 2-10 and 12-15 also are. Accordingly, Applicant asks that the Examiner reconsider and allow claims 2-10 and 12-15, as amended herein.

CONCLUSION

In view of the foregoing amendment and remarks, Applicant considers the Response herein to be fully responsive to the referenced Office Action, and respectfully submits that the pending claims are in condition for allowance. Early and favorable reconsideration is therefore respectfully solicited. If there are any remaining issues or the Examiner believes that a telephone conversation with Applicant's attorney would be helpful in expediting the prosecution of this application, the Examiner is invited to call the undersigned at 617-832-1118. Should an extension of time be required, Applicant hereby petitions for same and requests that the extension fee and any other fee required for timely consideration of this application be charged to Deposit Account No. 06-1448.

Respectfully submitted,



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